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Progress on the NIF

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PROGRESS ON THE NATIONAL IGNITION FACILITY *

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Abstract: The National Ignition Facility (NIF) is a 192 beam Nd-glass laser facility presently under construction at LLNL. When completed, NIF will produce 1.8 MJ, 500 TW of ultraviolet light making it the world's largest and most powerful laser system. NIF will be the world's preeminent facility for performing experiments for Inertial Confinement Fusion (ICF) and High Energy Density Science (HEDS). The Project, begun in 1995, is over 80% complete. The building and the beam path are essentially complete. Nearly all of the functionality of the laser subsystems has been demonstrated. NIF has demonstrated on a single beam basis that it meets its performance goals and shown the laser's precision and flexibility for pulse shaping, pointing, and timing. Beam conditioning techniques, important for target performance, were also demonstrated. The focal spot can be tailored to user specifications using phase plates. Temporal smoothing using smoothing by spectral dispersion (SSD) as well as polarization smoothing was demonstrated. The remaining work is mostly to complete the optics and install them in the beam path and complete the utilities. Presently, eight beams have been activated through the amplifiers and spatial filters to the switchyard wall. Over 150 kJ of 1ω light has been produced with just 4% of the NIF capacity activated. The Project is scheduled for completion in 2009 and plans have been developed to begin ignition experiments in 2010. This talk will provide NIF status, the plan to complete NIF, and the path to ignition.

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